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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/699,704	10/30/2000	Heribert Weber	10191/1616	7028

26646 7590 07/22/2003

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EXAMINER

MARTIR, LILYBETT

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 07/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/699,704

Applicant(s)

WEBER ET AL.

Examiner

Lilybett Martir

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-13 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-13 and 19-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,3-5 and 7-13 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinard et al. (Pat. 5,393,351) in view of either Cook Jr. (Pat. 5,237,867) or Kawai et al. (Pat. 5,965,811). Kinard et al. teaches the claimed invention, including:

- With respect to claim 1, Kinard teaches a frame as in element 202 formed by silicon; a membrane held by the frame as in elements 260 and above in Figure 3; a metal layer as in element 208 including a first structure and a second structure and being arranged above the frame; a heating element as are elements 206, 506 or 706 formed by a first structure in the metal layer; at least one temperature measurement element as are elements 208, 210, 508, 510, 708 or 710 formed by a second structure in the layer; and a moisture barrier as in element 268 arranged above the metal layer (Col. 11, lines 15-17). Kinard fails to disclose the incorporation of a moisture barrier arranged above the metal layer comprised by Silicon Nitride. Kawai et al. teaches the utilization of a protecting layer 3 arranged above metallic elements 4-6 made of

Silicon Nitride (Col. 1; lines 48-52). Cook Jr. also teaches the utilization of a layer 116 arranged over metallic elements 60a,60b,62a and 62b which is made of Silicone Oxinitride (Col. 12, lines 21-23). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the thermal detector of Kinard utilizing the teachings of the sensing devices of either Kawai et al. or Cook Jr. by providing it with a protective layer arranged over their metallic elements to insulate and protect the metallic detectors and emitters from hazardous environmental conditions therefore making said detector more reliable and durable.

- With respect to claim 3, Kinard et al. teaches the use of silicon nitride layers as in elements 262 and 270. But he fails to mention the utilization of his nitride layer as a moisture barrier. Kawai et al. teaches the utilization of a protecting layer 3 arranged above metallic elements 4-6 made of Silicon Nitride (Col. 1, lines 48-52). Cook Jr. also teaches the utilization of a layer 116 arranged over metallic elements 60a,60b,62a and 62b which is made of Silicone Oxinitride (Col. 12, lines 21-23). Since it has been held that rearranging parts of an invention involves only routine skill in the art. (In re Japikse, 86 USPQ70); it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the thermal detector of Kinard utilizing the teachings of the sensing devices of either Kawai et al. or Cook Jr. by providing it with a protective layer arranged over their metallic elements

to insulate and protect the metallic detectors and emitters from environmental conditions therefore making said detector more reliable and durable.

- With respect to claim 4, Kinard teaches a moisture barrier forming a top layer of the mass flow sensor as noted in the position of element 268 in Figure 3.
- With respect to claim 5, Kinard et al. teaches a moisture barrier as in element 268 formed at least in part by at least one of a top sandwich system and a bottom sandwich system (note in Figure 1 that the elements that are positioned above element 260 are sandwiched since they are inserted between other elements), a top sandwich system including at least one first silicon oxide layer as in element 264 and at least one first silicon nitride layer as in element 262; and a bottom sandwich system arranged beneath the metal layer and including at least one second silicon oxide layer as in element 260 and at least one second nitride layer as in element 270.
- With respect to claim 7, Kinard et al. teaches a silicon oxide layer arranged beneath the metal layer as in element 264 in Figure 3.
- With respect to claim 8, Kinard et al teaches the utilization of a nitride layer as in element 262 in Figure 3.
- With respect to claim 9, Kinard et al teaches a silicon oxide layer 260 formed by a thermal oxidation (Col. 6, lines 50-53) arranged between nitride layers as in elements 262 and 270.

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- With respect to claim 10, Kinard et al teaches a nitride layer including a silicon nitride layer as in element 262 (Col. 10, lines 67-68).
- With respect to claim 11, Kinard et al teaches an oxide layer as in element 260 arranged in a recess area beneath the nitride layer.
- With respect to claim 12, Kinard et al teaches a recess as in element 226, the utilization of oxide layers as in element 260 and nitride layers as in elements 270 and 262. Kinard et al. fails to teach a recess that does not contain an oxide layer. Kawai et al. teaches a sensing arrangement where the lowermost layer 2 in his recess 15 is made of Silicone Nitride. Since it has been held that the omission of an element and its function in a combination where the remaining elements perform the same function as before involves only routine skill in the art (In re Karlson, 136 USPQ 184), it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the thermal detector of Kinard utilizing the teachings of the sensing arrangement of Kawai et al. by rearranging or omitting the presence of a layer in said recess therefore exposing the nitride layer in order utilize the nitride layer as a moisture barrier to further protect the detector from environmental hazards that may cause malfunction.
- With respect to claim 13, Kinard et al. teaches a nitride layer formed by one of a PECVD operation, a LPCVD operation, or a CVD operation (Col. 5, lines 10-18).

- With respect to claim 19, Kinard teaches a frame as in element 202 formed by silicon; a membrane held by the frame as in elements 260 and above in Figure 3; a metal layer as in element 208 including a first structure and a second structure and being arranged above the frame; a heating element as are elements 206, 506 or 706 formed by a first structure in the metal layer; at least one temperature measurement element as are elements 208, 210, 508, 510, 708 or 710 formed by a second structure in the layer, a moisture barrier as in element 268 formed at least in part by at least one of a top sandwich system and a bottom sandwich system (note in Figure 1 that the elements that are positioned above element 260 are sandwiched since they are inserted between other elements), a top sandwich system including at least one first silicon oxide layer as in element 264 and at least one first silicon nitride layer as in element 262; and a bottom sandwich system arranged beneath the metal layer and including at least one second silicon oxide layer as in element 260 and at least one second nitride layer as in element 270. Kinard fails to teach his nitride layer being formed on top of the metal layer. Cook Jr. teaches the arrangement of an oxinitirde layer 116 on top of the metallic layers 60a,60b,62a and 62b as noted in Figure 5. Kawai et al. teaches the arrangement of a nitride layer 3 on top of metallic layers 4-6. Since it has been held that rearranging parts of an invention involves only routine skill in the art. (In re Japikse, 86 USPQ70); it would have been obvious at the time the invention was

made to a person having ordinary skill in the art to modify the thermal detector of Kinard utilizing the teachings of the sensing devices of either Kawai et al. or Cook Jr. by providing it with a protective layer arranged over their metallic elements to insulate and protect the metallic detectors and emitters from environmental conditions therefore making said detector more reliable and durable.

- With respect to claim 20, Kinard et al. teaches a silicone oxide layer 260, a silicon nitride layer 262 on top of the silicone oxide layer, and another silicon oxide layer 264 on top of said silicon nitride layer. Kinard fails to teach the utilization of two additional layers made of silicone nitride and silicon oxide being further arranged in that order over the already disclosed layers. Since it has been held that the mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.); it would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the existing layers in the device of Kinard et al. to therefore make it stronger, durable, and capable of withstanding more severe environmental conditions.
- With respect to claim 21, Kinard et al. teaches the utilization of a bottom layer 270 which is removed in a recess area of the sensing device. Kawai et al. teaches the same thing in the arrangement of his protecting film 17. Kinard et al. fails to teach the specific utilization of a silicone oxide layer in said location, but he does teach the utilization of said

material in a plurality of layers of said sensor. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the sensing arrangement of either Kinard et al. or Kawai et al. by utilizing and rearranging a well known material as is silicone oxide in the bottom layer of said arrangement to make said device durable and reliable.

- With respect to claim 22, Kinard et al. teaches a nitride layer formed by one of a PECVD operation, a LPCVD operation, or a CVD operation (Col. 5, lines 10-18).

3. Claims 6 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinard et al. (Pat. 5,393,351) in view of either Cook Jr. or Kawai et al. as applied to claims 5 and 19 above and further in view of Sato et al. (Pat. 5,852,239).

- With respect to claims 6 and 23, Kinard et al. as modified above fails to teach at least one of the top sandwich system and the bottom sandwich system including at least one silicone carbide layer. Sato et al. teaches a flow sensor having a thin film of silicon carbide deposited over the surface of a substrate (Col. 4, lines 16-18) and therefore that the utilization of said material is well known in the art of flow sensors. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the thermal detector of Kinard utilizing the teachings of the sensing arrangement of Sato et al. by providing it with a layer of silicone carbide inside the membrane structure of the sensor for the purpose of utilizing a preferred well-known heat refractory material that would allow accurate flow measurements.

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Response to Arguments

4. Applicants amendments raised new issues that made necessary the new art to be applied and therefore, the arguments presented against Kinard et al. are said to be moot due to the new grounds of rejection.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (703)305-6900. The examiner can normally be reached on 9:00 AM to 5:30 PM.

6. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (703)305-4816. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.

7. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.



Lilybett Martir
Examiner
Art Unit 2855

LCM
July 15, 2003



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